

**REMARKS**

Applicants appreciate the Examiner's thorough consideration provided the present application. Claims 1, 2, 4, 6-10 and 12-16 are now present in the application. Claims 1, 2, 6, 9, 10, 12, 14, 15 and 16 have been amended. Claims 1 and 9 are independent. Reconsideration of this application, as amended, is respectfully requested.

**Claim Objections**

Claim 6 has been objected to due to the presence of minor informalities. Claim 6 has been amended to address the Examiner's requested correction. Accordingly, this objection has been obviated and/or rendered moot. Reconsideration and withdrawal of this objection are respectfully requested.

**Claim Rejections Under 35 U.S.C. § 103**

Claims 1, 2, 4-6 and 15 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Gutfeld, U.S. Patent No. 6,055,035, in view of Gyoda, U.S. Patent Application Publication No. US 2002/0063842. Claims 9, 10, 12-14 and 15 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Gyoda in view of Gutfeld, and further in view of Hashimoto, U.S. Patent No. 6,583,848. Claims 7 and 8 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Gutfeld in view of Gyoda, and further in view of Masazami, U.S. Patent No. 6,331,884. These rejections are respectfully traversed.

Complete discussions of the Examiner's rejections are set forth in the Office Action, and are not being repeated here.

In light of the foregoing amendments, Applicants respectfully submit that these rejections have been obviated and/or rendered moot. While not conceding to the Examiner's rejections, but merely to expedite prosecution, as the Examiner will note, independent claims 1 and 9 have been amended to address the Examiner's rejections.

Independent claim 1 has been amended to recite a combination of steps including "applying an on voltage to a resonator during emitting of the liquid crystal material to generate a vibration".

Independent claim 9 has been amended to recite a combination of elements including "a resonator for generating a vibration upon application of an on voltage to the resonator during emitting of the liquid crystal material".

Support for the above combinations of steps and elements as set forth in amended independent claims 1 and 9 can be found on paragraph 0037 of the specification as originally filed. Applicants respectfully submit that the combinations of steps and elements as set forth in amended independent claims 1 and 9 are not disclosed or suggested by the references relied on by the Examiner.

Gutfeld discloses an apparatus for filling liquid crystal material, including a CPU 25, an LC reservoir 23, a nozzle fixture 21, and a scanning arm 24 (see FIG. 2B). The nozzle 21, the scanning arm 24 and the LC reservoir 23 are controlled by the CPU 25 to maintain the proper pressure and travel speed to eject a fixed amount of LC material onto the panel. However, Gutfeld fails to disclose a resonator and therefore fails to disclose "applying an on voltage to a resonator during emitting of the liquid crystal material to generate a vibration" as recited in

amended claim 1 and “a resonator for generating a vibration upon application of an on voltage to the resonator during emitting of the liquid crystal material” as recited in amended claim 9.

The Examiner turned to rely on Gyoda’s ink jet nozzle 50 as shown in FIG. 7. Gyoda’s ink jet nozzle 50 includes two electrodes 60, a piezoelectric element 59 interposed between the two electrodes 60, a vibrator 52, an LC reservoir 54 and a nozzle aperture 57. Gyoda in paragraph 0109 discloses that when the electrodes 60 are supplied with a voltage, the piezoelectric element 59 is outwardly curved, causing the vibrator 52 to outwardly curve or deform integrally with the piezoelectric element 59. Accordingly, the volume of the space 54 increases. An amount of liquid crystal equal to an increase in the volume flows into the space 54 from the reservoir 55 through the supply passage 56. At the moment the voltage to the piezoelectric element 59 is cut off, the piezoelectric element 59 and the vibrator 52 restore back to the initial shapes thereof. The space 54 is also restored to the original volume thereof, thereby resulting in an increase in pressure of the liquid crystal within the space 54. The pressure increase can cause a droplet 61 of the liquid crystal to be discharged through the nozzle aperture 57 toward the counter substrate base material 112A.

In other words, during emitting the LC material from the nozzle aperture 57, the on and off of the voltage on the electrodes 60 has to be applied alternately in order to generate the vibration and to change the volume of the space 54. Simply applying an on voltage to the electrodes 60 merely deforms the piezoelectric element 59 and the vibrator 52, but will not generate the vibration and pressure to emit the LC material in the space 54. Therefore, Gyoda fails to teach “applying an on voltage to a resonator during emitting of the liquid crystal material to generate a vibration” as recited in amended claim 1 and “a resonator for generating a vibration

upon application of an on voltage to the resonator during emitting of the liquid crystal material”  
as recited in amended claim 9.

Therefore, even if Gutfeld and Gyoda were combinable, assuming *arguendo*, the combination of Gutfeld and Gyoda as applied by the Examiner would still fail to teach or suggest the invention as recited in claims 1 and 9 because Gutfeld’s CPU 25 has to apply the on/off voltage alternately, not just an on voltage as recited in amended independent claims 1 and 9, to Gyoda’s electrodes 60 in order to generate the vibration during emitting of the liquid crystal material.

With regard to the Examiner’s reliance on Hashimoto and Masazami, these references have only been relied on for their teachings related to the stage and the subject matter of dependent claims. These references also fail to disclose the above combinations of steps and elements as set forth in amended independent claims 1 and 9. Accordingly, these references fail to cure the deficiencies of Gutfeld and Gyoda.

Accordingly, none of the references relied on by the Examiner individually or in combination teach or suggest the limitations of amended independent claims 1 and 9. Therefore, Applicants respectfully submit that amended independent claims 1 and 9 clearly define over the teachings of the Background art nor Higashino.

In addition, claims 2, 4, 6-8, 10 and 12-16 depend, either directly or indirectly, from independent claims 1 and 9, and are therefore allowable based on their respective dependence from independent claims 1 and 9, which are believed to be allowable.

In view of the above remarks, Applicants respectfully submit that claims 1, 2, 4, 6-10 and 12-16 clearly define the present invention over the references relied on by the Examiner.

Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 103 are respectfully requested.

### CONCLUSION

All the stated grounds of rejection have been properly traversed and/or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently pending rejections and that they be withdrawn.

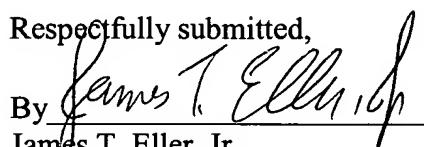
It is believed that a full and complete response has been made to the Office Action, and that as such, the Examiner is respectfully requested to send the application to Issue.

In the event there are any matters remaining in this application, the Examiner is invited to contact the undersigned at (703) 205-8000 in the Washington, D.C. area.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§1.16 or 1.17; particularly, extension of time fees.

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Respectfully submitted,

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